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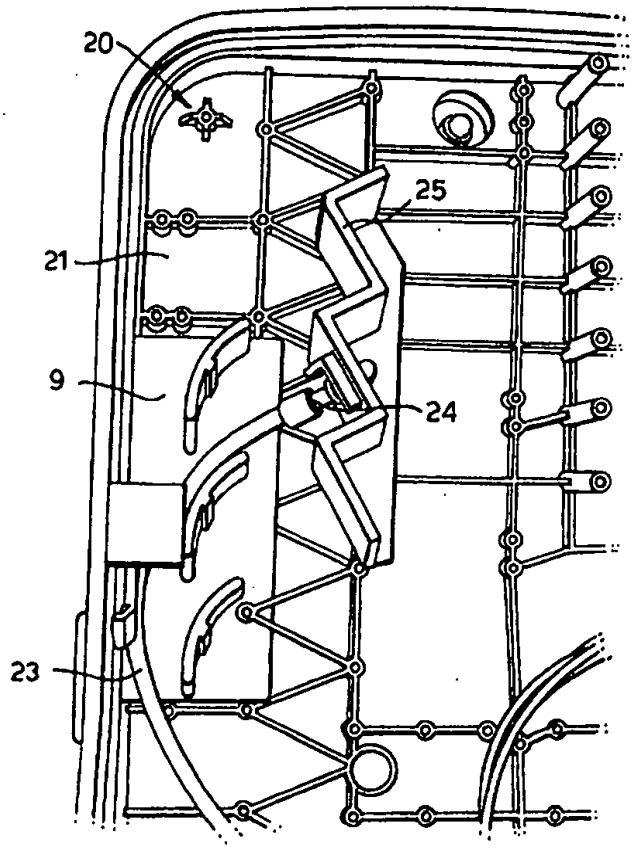
(54) Title: PATCH PANEL ASSEMBLY

(57) Abstract

An optical fibre patch panel assembly, comprising: (a) a patch panel (25), comprising a plurality of connector securement means, by means of each of which an optical fibre connector (25) may be secured to the patch panel; (b) one or more optical fibre guide means which, in use, guide(s) one or more optical fibres (23) extending from the patch panel; and (c) a generally flat base on which, at least in use, the patch panel is located; characterised in that the or each optical fibre guide means includes at least one attachment means, by which the guide means may be removably attached directly or indirectly to the patch panel (25) and/or the base (9) by being moved towards the base in a direction substantially perpendicular thereto.



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PATCH PANEL ASSEMBLY

The present invention relates to optical fibre communications, and in particular to an optical fibre patch panel assembly suitable for a closure, a cabinet, a sub-rack or other container.

A patch panel is a support on which optical fibre connectors may be mounted. Patch panels are commonly used in optical fibre closures, optical fibre cabinets, and optical fibre distribution racks, for example. The optical fibres which are interconnected by means of the optical fibre connectors are normally contained in protective outer jackets. Such optical fibres may, for example, be pigtails, patch cords, jumpers etc.

A first aspect of the present invention provides an optical fibre patch panel assembly, comprising:

(a) a patch panel, comprising a plurality of connector securement means, by means of each of which an optical fibre connector may be secured to the patch panel;

(b) one or more optical fibre guide means which, in use, guide(s) one or more optical fibres extending from the patch panel; and

(c) a generally flat base on which, at least in use, the patch panel is located;

characterised in that the or each optical fibre guide means includes at least one attachment means, by which the guide means may be removably attached directly or indirectly to the patch panel and/or the base by being moved towards the base in a direction substantially perpendicular thereto.

The assembly according to the invention has the advantage that the or each optical fibre guide means may be attached after the optical fibre connectors have been secured to the patch panel. This provides greater access to the patch panel compared

to systems in which the guide means are permanently in place, and thus enables the connectors to be attached to the patch panel more easily and with less chance of damage to the optical fibres and the connectors. Also, because the guide means may be attached by being moved in a direction substantially perpendicular to the base, the guide means may be passed between the optical fibres extending from the patch panel without significantly disturbing the optical fibres (and thus without damaging the fibres or causing transient signal losses in the fibres).

In some embodiments of the invention, the attachment means of the or each optical fibre guide means comprises at least one groove and/or projection which, in use, may engage at least one corresponding projection and/or groove (respectively) on the patch panel, to permit the optical fibre guide means to be slid onto the patch panel.

Additionally or alternatively, the base may include at least one fastening means which may cooperate with an attachment means of the or each optical fibre guide means to attach the guide means to the base. The cooperating attachment means and fastening means may, for example, be interlocking, e.g. snap-fit, parts. The or each fastening means preferably comprises at least on slot, and the or each attachment means preferably comprises at least one resilient detent. The or each fastening means may advantageously comprise part of a plate which, at least in use, is attached to a main part of the base. The plate may be attached to the main part of the base by means of screws, bolts, snap-fit parts etc, for example.

In some embodiments of the invention, a plurality of optical fibre guide means may be joined together, preferably at or near their ends furthest from the base. The optical fibre guide means are preferably joined together by means of at least one joining member, which joining member preferably includes one or more attachment means which, in use, attach(es) the joining member directly to the patch panel.

The or each guide means is preferably in the form of at least one curved plate, or the like. The or each guide means preferably guides the optical fibre(s) extending

from the patch panel in a controlled bend which does not violate the critical bend radius of the optical fibre(s). The guide means advantageously provide protection to the optical fibres immediately adjacent to the patch panel.

According to a second aspect, the invention provides a container, preferably an optical fibre closure or cabinet, including an optical fibre patch panel assembly according to the first aspect of the invention.

The invention will now be described, by way of example, with reference to the accompanying drawings, of which:

Figure 1 shows one type of patch panel assembly according to the invention;

Figure 2 shows a base plate of another type of patch panel assembly according to the invention;

Figure 3 shows an optical fibre guide means for attachment to the base plate of Figure 2;

Figure 4 shows another type of optical fibre guide means of an assembly according to the invention;

Figure 5 shows an assembled patch panel assembly of the type shown in figures 2 and 3; and

Figures 6 and 7 show an assembled patch panel assembly including an optical fibre guide means of the type shown in Figure 4.

Figure 1 shows a patch panel 1, with optical fibre connector securement sockets 2, and optical fibre guide means 3 of a patch panel assembly according to the

invention. Each guide means 3 has the form of a curved plate, and has a projection 5 which can slide into a respective slot 7 in the patch panel.

Figure 2 shows a plate 9 of another type of patch panel assembly, which, in use, is attached to a main part of the base. The plate 9 includes three slots 10 for receiving three guide means. A suitable guide means 11 is shown in Figure 3. The guide means 11 has resilient detents 13 which arranged to interlock with a slot 10 in the plate 9, thereby securing the guide means 11 to the base.

Figure 4 shows optical fibre guide means 15 of another type of patch panel assembly according to the invention. In this case, there are three pairs of guide means which are joined together by means of a joining member 17 at the ends of the guide means arranged to be furthest from the base. The joining member has attachment means 18, in the form of projections 19, to attach it directly to a patch panel.

Figure 5 shows a patch panel assembly of the type illustrated in figures 2 and 3 assembled in an optical fibre cabinet 20. The base 21 of the cabinet 20 comprises the main part of the base of the assembly, to which the base plate 9 is attached. An optical fibre pigtail 23 is shown, its optical fibre connector 24 mounted on the patch panel 25.

Figures 6 and 7 show views of another patch panel assembly according to the invention, assembled in an optical fibre cabinet 20. This patch panel assembly includes guide means 15 of the type shown in Figure 4, i.e. with a joining member 17 joining the guide means. The joining member is attached to the patch panel 25 by joining means 18.

Claims

1. An optical fibre patch panel assembly, comprising:

(a) a patch panel, comprising a plurality of connector securement means, by means of each of which an optical fibre connector may be secured to the patch panel;

(b) one or more optical fibre guide means which, in use, guide(s) one or more optical fibres extending from the patch panel; and

(c) a generally flat base on which, at least in use, the patch panel is located;

characterised in that the or each optical fibre guide means includes at least one attachment means, by which the guide means may be removably attached directly or indirectly to the patch panel and/or the base by being moved towards the base in a direction substantially perpendicular thereto.

2. An assembly according to Claim 1, in which the attachment means of the or each optical fibre guide means comprises at least one groove and/or projection which, in use, may engage at least one corresponding projection and/or groove respectively on the patch panel, to permit the optical fibre guide means to be slid onto the patch panel.

3. An assembly according to Claim 1 or Claim 2, in which the base includes at least one fastening means which may cooperate with a said attachment means of the or each optical fibre guide means to attach the guide means to the base.

4. An assembly according to Claim 3, in which the or each fastening means comprises at least one slot.

5. An assembly according to Claim 3 or Claim 4, in which the or each fastening means comprises part of a plate which, at least in use, is attached to a main part of the base.

6. An assembly according to any preceding claim, in which a plurality of said optical fibre guide means are joined together at or near their ends furthest from the base.

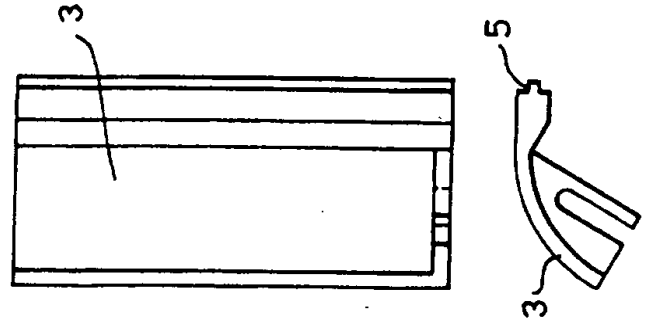
7. An assembly according to Claim 6, in which the optical fibre guide means are joined together by means of at least one joining member, which joining member includes one or more said attachment means which, in use, attach(es) the joining member directly to the patch panel.

8. An assembly according to any preceding claim, in which the or each guide means is in the form of at least one curved plate.

9. An optical fibre patch panel assembly substantially as illustrated in the accompanying drawings.

10. An optical fibre patch panel assembly substantially as described herein with reference to the accompanying drawings.

11. A container, preferably an optical fibre closure or cabinet, including an optical fibre patch panel assembly according to any preceding claim.



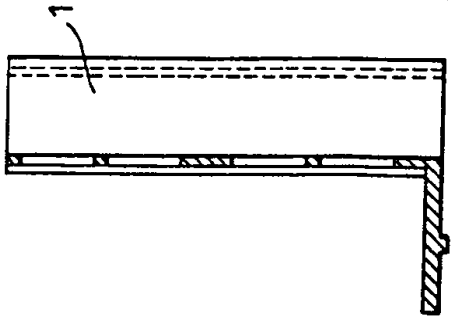
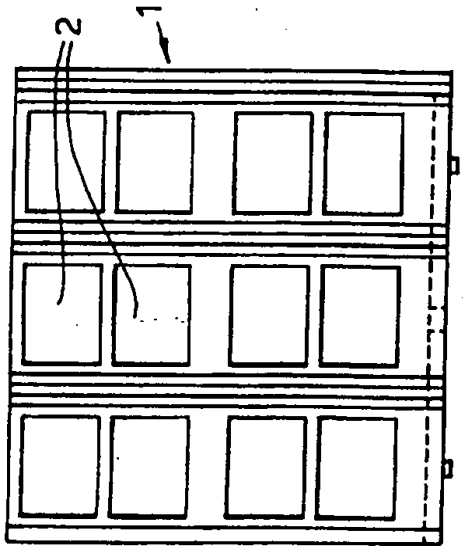
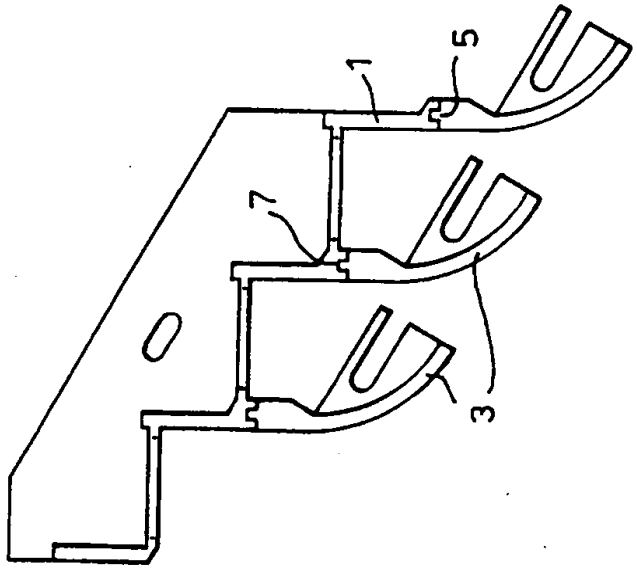


Fig.1.





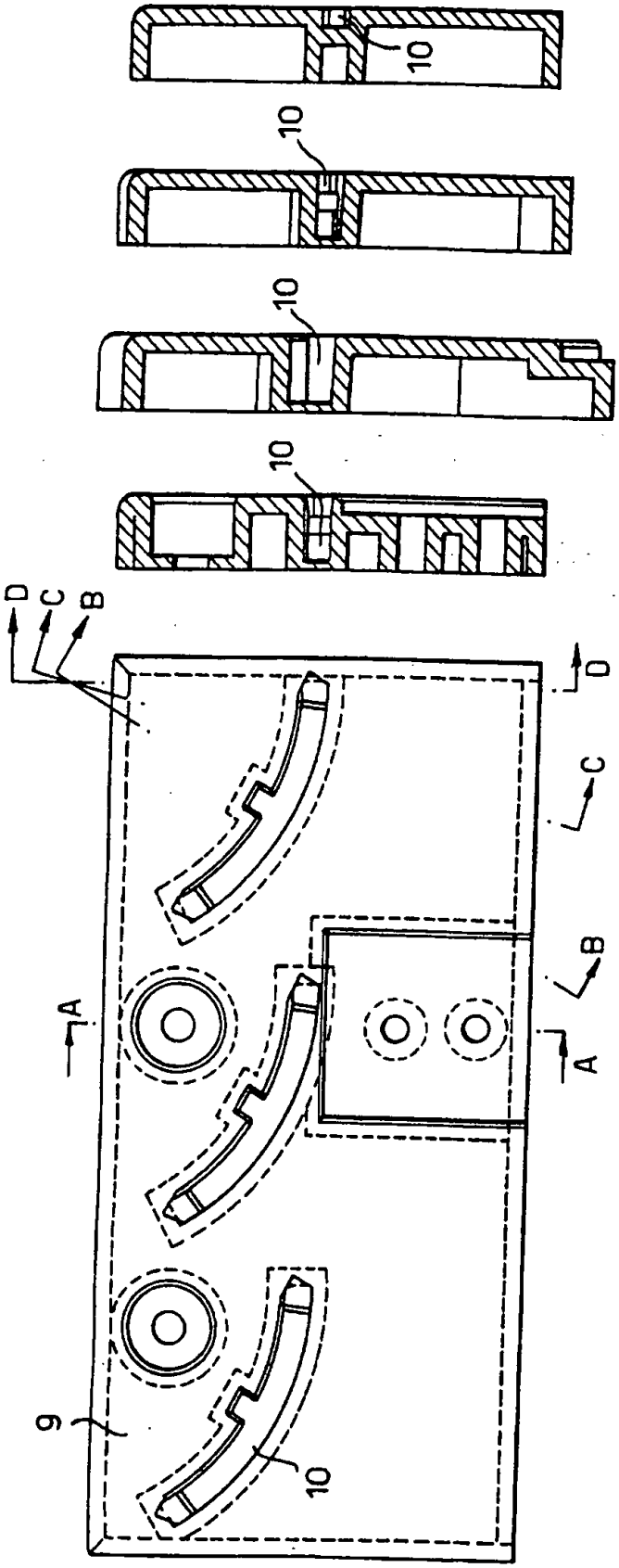


Fig.2.

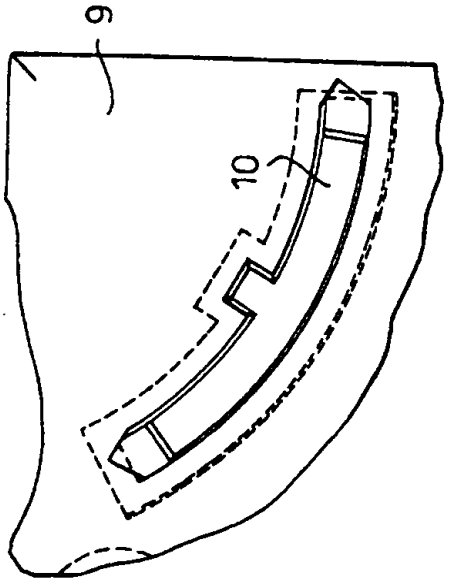


Fig.3.

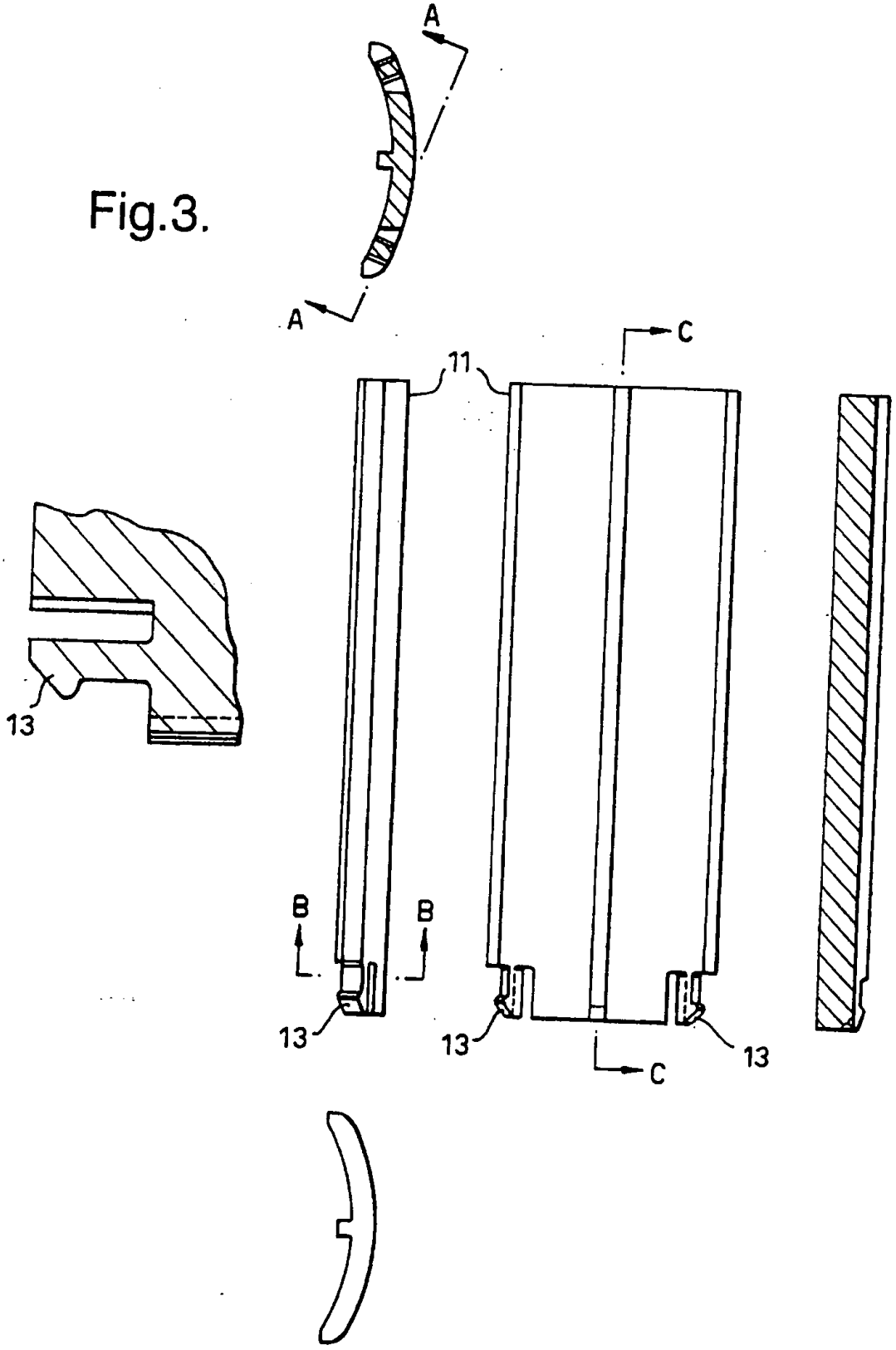


Fig.4.

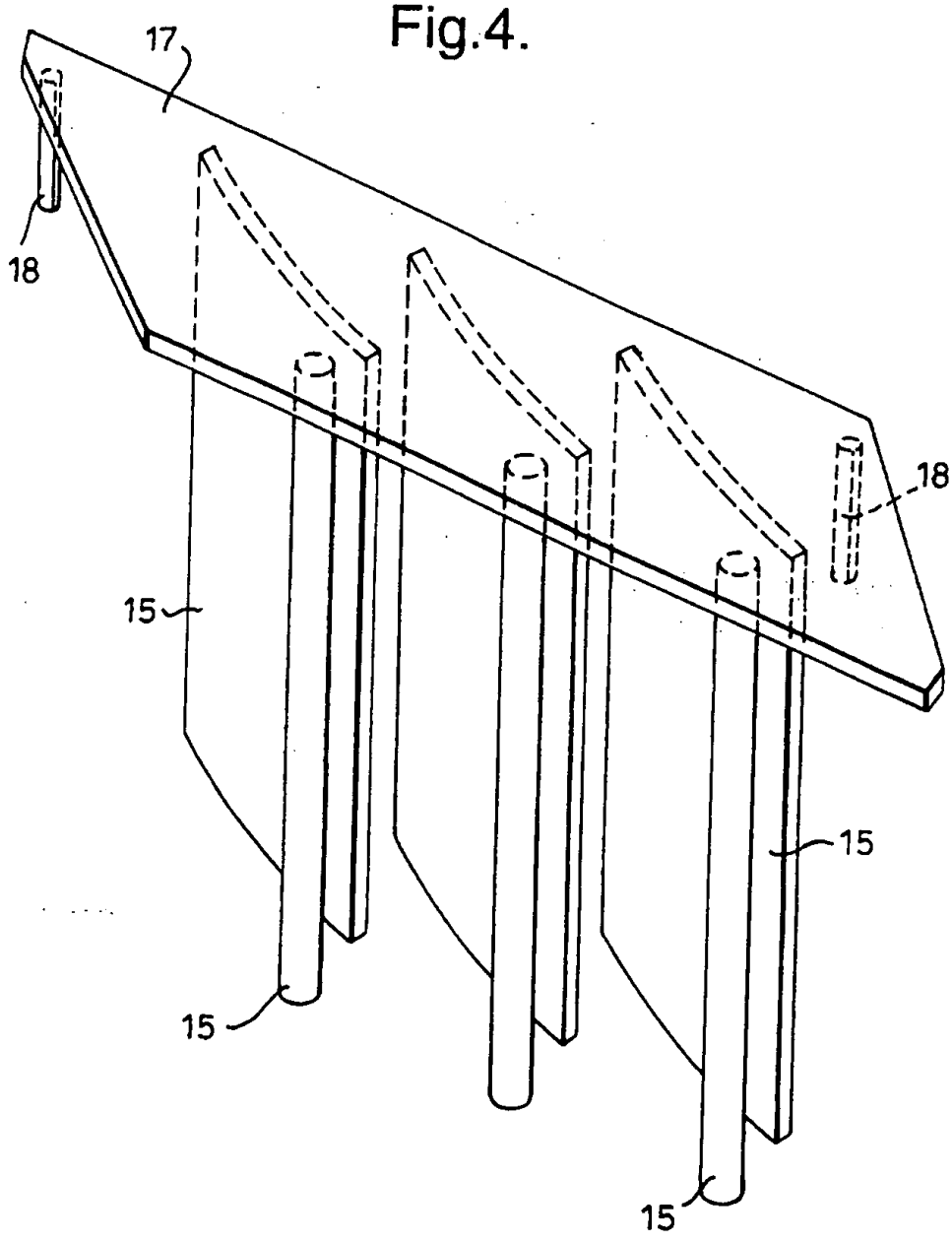


Fig.5.

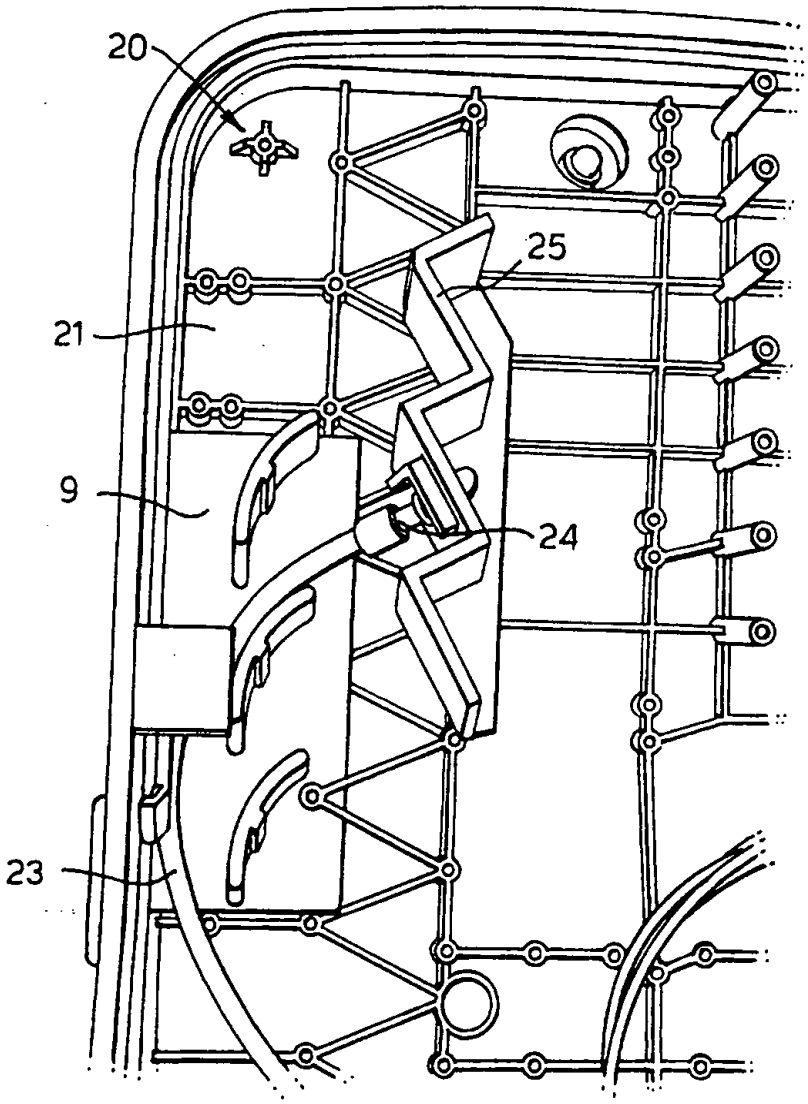


Fig.6.

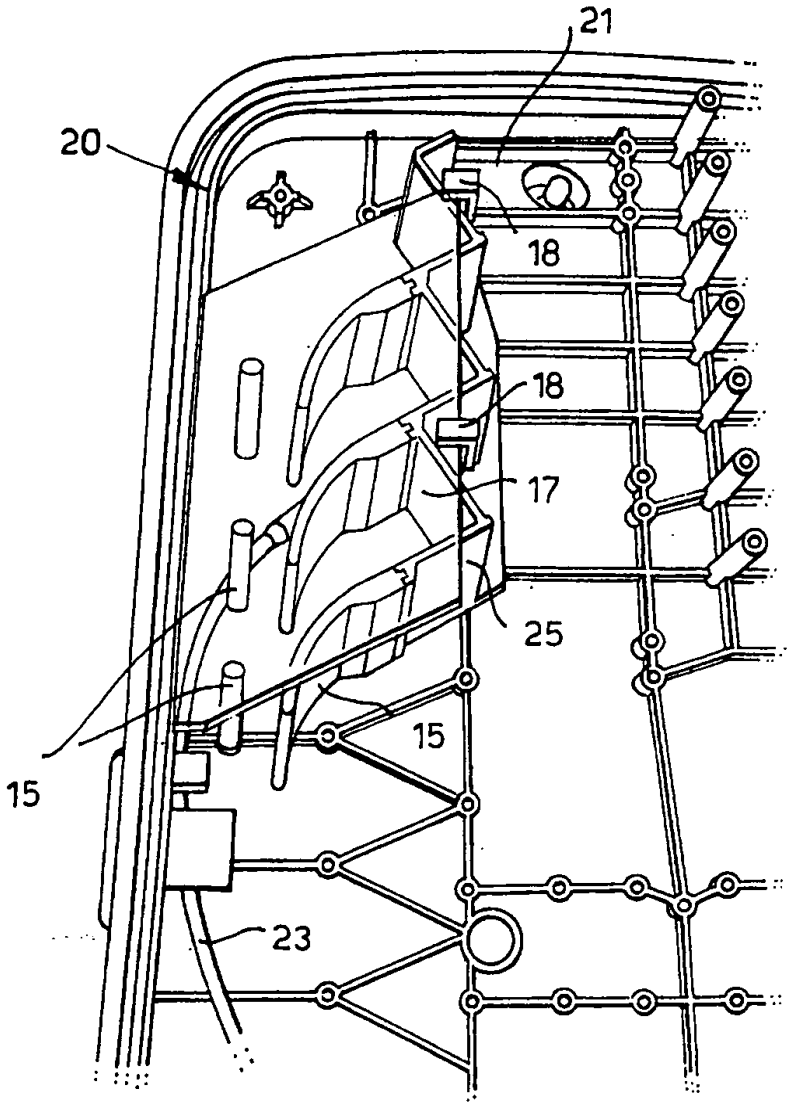
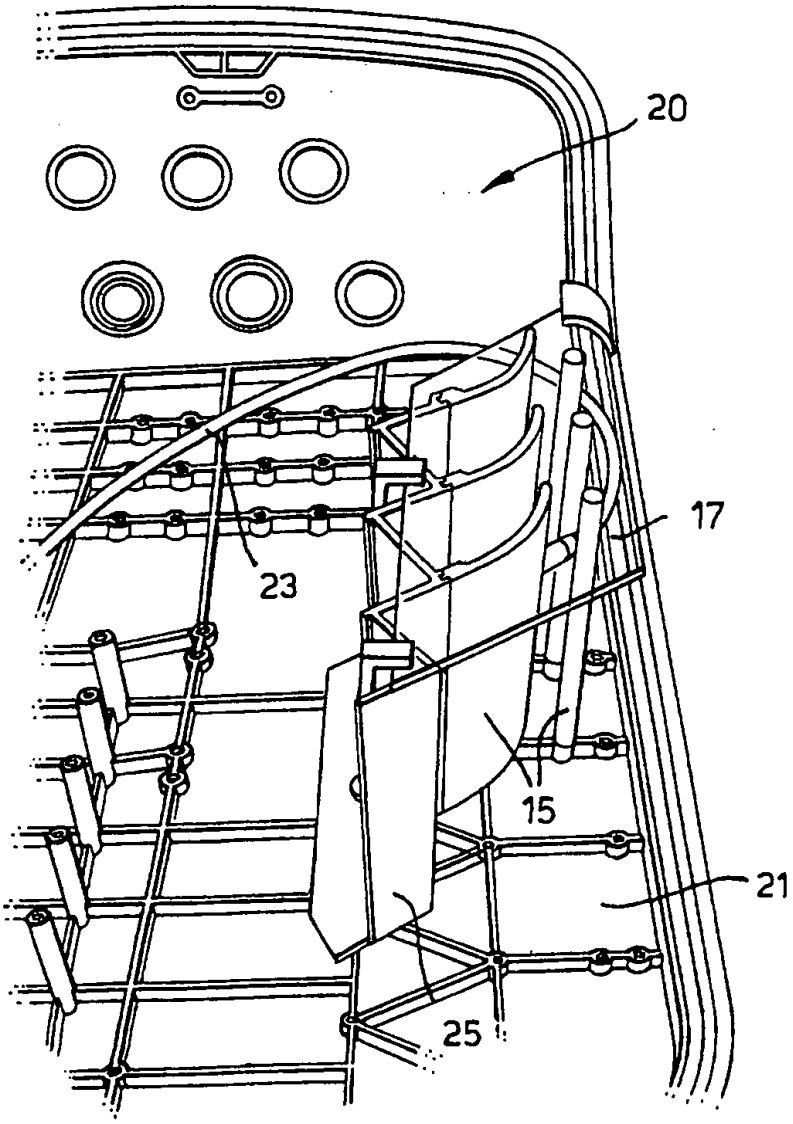


Fig.7.



INTERNATIONAL SEARCH REPORT

Intern. al Application No
PCT/GB 97/02469

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 G02B6/44

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 G02B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 530 954 A (LARSON GLEN M ET AL.) 25 June 1996 see column 2, line 48 - column 3, line 65; figures 4,8,10	1-11
P,A	US 5 640 482 A (B. ELTRINGHAM BARRY ET AL.) 17 June 1997 see abstract; figures 1-5	1,6
A	DE 35 27 914 A (STANDARD ELEKTRIK LORENZ AG) 12 February 1987 see column 2, line 13 - line 66; figure 1	1,7,8
A	EP 0 711 087 A (KRONE AG) 8 May 1996 see column 2, line 46 - column 3, line 26; figures 1,4	1-4,11

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[X] Further documents are listed in the continuation of box C.

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A	DE 43 36 079 A (PHILIPS PATENTVERWALTUNG) 27 April 1995 see column 1 - column 2; figure -----	1,6,8

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